In the Claims

1. (Currently Amended) An apparatus for screening a compound by monitoring the interactions of said compound with a specimen having fluorophore loaded target cells, said apparatus comprising:

an optical illumination unit comprising one or more LED ~~at least two~~ light sources, each of which generates a particular wavelength of light that is coupled to each fluorophore, wherein light from said ~~at least two~~ light sources is directed to illuminate said specimen;

a fluorescence separation unit coupled to receive emitted light simultaneously from each fluorophore at a single focal spot on ~~from~~ said specimen and separate at least three emitted wavelengths of light from said emitted light; and

a fluorescence detection unit coupled to said fluorescence separation unit to count photons emitted by said at least three wavelengths of emitted light.

2. (Currently Amended) The apparatus of claim 1 wherein said optical illumination unit further comprises a light processing unit coupled to said ~~laser beam~~ light sources ~~source~~, said light processing unit ~~circuit~~ altering the qualities of a light beam from said ~~first laser beam~~ light sources ~~source~~.

3. (Original) The apparatus of claim 1 further comprising at least two dichroic mirrors coupled to said optical illumination unit.

4. (Currently Amended) The apparatus of claim 1 wherein said fluorescence

separation unit further comprises ~~at least three dichroic polarizer analyzers and~~ at least three band-limited interference filters.

5. (Original) The apparatus of claim 1 further comprising at least three photo-detectors coupled to receive said at least three wavelengths of emitted light.

6. (Currently Amended) An apparatus for screening a compound by monitoring the interactions of said compound with a specimen having fluorophore-loaded target cells, said apparatus comprising:

an optical illumination unit comprising one or more ~~at least two~~ LED light sources ~~which generate polarized light~~ each of which generates a particular wavelength of light that is coupled to each fluorophore;

a plurality of filters coupled to said optical illumination unit to co-axially illuminate said specimen;

a fluorescence separation unit comprising at least two filters to direct and separate at least three emitted wavelengths of light from light simultaneously emitted from said flourophore at a single focal spot on said specimen ~~and couple each wavelength of light of said at least three emitted wavelengths of light to a separate dichroic polarizer analyzer, and~~; and

a fluorescence detection unit comprising at least three detectors, each of said detectors comprising a photo-detector.

7. (Currently Amended) The apparatus of claim 6 further comprising a light processing unit coupled to a ~~laser beam~~ light source, said light processing ~~circuit~~ unit altering the qualities of a light beam from said ~~laser beam~~ light source.

8. (Original) The apparatus of claim 6 further comprising an inverted microscope coupled to receive light emitted from said specimen.

9. (Original) The apparatus of claim 6 further comprising a computer coupled to said fluorescence detection unit.

10. (Currently Amended) An apparatus for screening a compound by monitoring its interactions with a specimen having fluorophore-loaded target cells, said apparatus comprising:

~~a first light source~~ at least one, LED light source that generates light of a particular wavelength that is coupled to a particular fluorophore;

~~a second light source;~~

a first dichroic mirror coupled to receive light from said ~~first light source and said second light source;~~

~~a second dichroic mirror coupled to receive light from said first light source which is passed by said first dichroic mirror and coupled to receive light from said second light source which is deflected by said first dichroic mirror, said second dichroic mirror being coupled~~ light source and to deflect said light from said light from said ~~first~~ light source ~~and said second light source~~ to said specimen and pass wavelengths of light simultaneously emitted from said flourophores at a single focal spot on said specimen;

a second ~~third~~ dichroic mirror that deflects a first wavelength of light from said wavelengths of light simultaneously emitted from fluorophores at a single focal spot on said specimen;

a third ~~fourth~~ dichroic mirror that deflects a second wavelength of light from said wavelengths of light simultaneously emitted from fluorphores at a single focal spot on

said specimen and passes a third wavelength of light from said specimen;

~~at least three dichroic polarizer-analyzers and~~ at least three band-limited interference filters; and

at least three photo-detectors coupled to receive outputs associated with said first, second and third wavelengths of light.

11. (Original) The apparatus of claim 10 further comprising a light processing unit.

12. (Original) The apparatus of claim 10 further comprising an inverted microscope coupled to receive light emitted from said specimen.

13. (Original) The apparatus of claim 10 further comprising a computer coupled to receive outputs of said at least three photo-detectors.

14. (Currently Amended) An apparatus for screening a compound by monitoring its interactions with a specimen having fluorophore loaded target cells ~~developing~~ to develop a profile of target cells in a specimen, said apparatus comprising:

at least one LED light source which generates a particular wavelength of light; ~~an argon-ion laser;~~

~~a xenon light source;~~

a first dichroic mirror coupled to receive light from said ~~argon-ion laser and said xenon~~ light source;

a second dichroic mirror ~~coupled to receive light from said argon-ion laser which is passed by said first dichroic mirror and coupled to receive light from said xenon light~~

~~source which is deflected by said first dichroic mirror, said second dichroic mirror being coupled to deflect said light from said argon-ion laser and said xenon light source to~~ that deflects a first wavelength of light from the wavelengths of light simultaneously emitted from fluorophores at a single focal spot on said specimen ~~and pass light emitted from said specimen;~~

~~a third dichroic mirror that deflects a first wavelength of light from said light emitted from said specimen;~~

a ~~fourth~~ third dichroic mirror that deflects a second wavelength of light from said light emitted from said specimen and passes a third wavelength of light from said wavelengths of lights simultaneously emitted from fluorophores at a single focal sport on said specimen;

~~at least three dichroic polarizer-analyzers~~, at least three band-limited interference filters for their respective emission wavelengths;

at least three photo-detectors coupled to receive the outputs associated with said first, second and third wavelengths of light; and

a computer coupled to receive outputs of said at least three photo-detectors.

15. (Currently Amended) A method of screening a compound by monitoring the interactions of said compound with a specimen having fluorophore loaded target cells, said method comprising the steps of:

coupling ~~a first~~ at least one LED light source to said specimen to illuminate said specimen such that a particular wavelength of light is coupled to specific fluorophores;

~~coupling a second light source to said specimen to illuminate said specimen~~;

separating at least three wavelengths of light simultaneously emitted from fluorophores at a single focal spot on said specimen; and

detecting photons from said three emitted wavelengths of light.

16. (Currently Amended) The method of claim 15 further comprising a step of filtering said light from said ~~laser beam~~ light source.

17. (Currently Amended) The method of claim 15 further comprising a step of expanding said light from said ~~laser beam~~ light source.

18. (Currently Amended) The method of claim 15 further comprising a step of focusing light from ~~said first light source and~~ said ~~second~~ light source on said specimen.

19. (Original) The method of claim 15 further comprising a step of filtering said first, second and third wavelengths of light.

20. (Original) The method of claim 15 further comprising a step of generating a count of photons from said first, second and third wavelengths of light.

21. (Original) The method of claim 15 further comprising a step of generating a response profile of said target cells.

22. (Currently Amended) A method of screening a compound by monitoring the interactions of said compound with a specimen having fluorophore loaded target cells, said method comprising the steps of:

~~coupling an argon ion laser to said specimen to illuminate said specimen~~;

coupling ~~a xenon~~ at least one LED light source to said specimen to ~~co-axially~~

illuminate said specimen;

separating at least three wavelengths of light simultaneously emitted from fluorophores at a single focal spot on said fluorophore-loaded specimen;

detecting ~~photon~~ photons from said three emitted wavelengths of light;

generating a count of photons from said first, second, and third wavelengths of light; and

generating a response profile of said target cells.

23. (Currently Amended) A method for identifying a pharmaceutically active compound, said method comprising the steps of:

interacting a compound with a specimen containing at least three chemicals of interest; and

simultaneously detecting the activities of said at least three chemicals from optical signals simultaneously emitted from a single focal spot on ~~from~~ the specimen.

24. Withdrawn (Currently Amended) A system for two-dimensional high-throughput kinetic scanning of a multi-well plate, comprising:

~~One~~ one or more sources of light such that a particular wavelength of light is coupled to a particular excitable chemical species;

two perpendicular acousto-optical modulators spaced so that each is within the range of deflection of the first order beams of the other modulator;

a convergence lens responsive to the source of light;

an optical fiber array responsive to the source of light;

a system for analyzing the light simultaneously collected from each excited chemical species on a single focal spot the multi-well plate; and

a computer system to operate the scanning system.

25. Withdrawn. (Currently Amended). A light source for use in an apparatus for screening a compound by monitoring its interactions with a specimen having fluorophore loaded target cells, said light source comprising:

one or more light emitting diodes which emit light at differing wavelengths such that a particular wavelength of light is coupled to a particular fluorophore;

an apparatus for integrating the light emitted by the diodes into a single output beam;

an apparatus for applying a modulation waveform function to the single output beam;

an apparatus for changing the frequency of the modulation waveform function;

an apparatus for changing the amplitude of the modulation waveform function;

an apparatus for changing the average intensity of the modulation waveform function;

an apparatus for changing the waveform of the modulation waveform function, to a sine wave, a square wave, or a pulse; and

an apparatus for changing the duration of the pulse in the modulation waveform function.